Flying Safety

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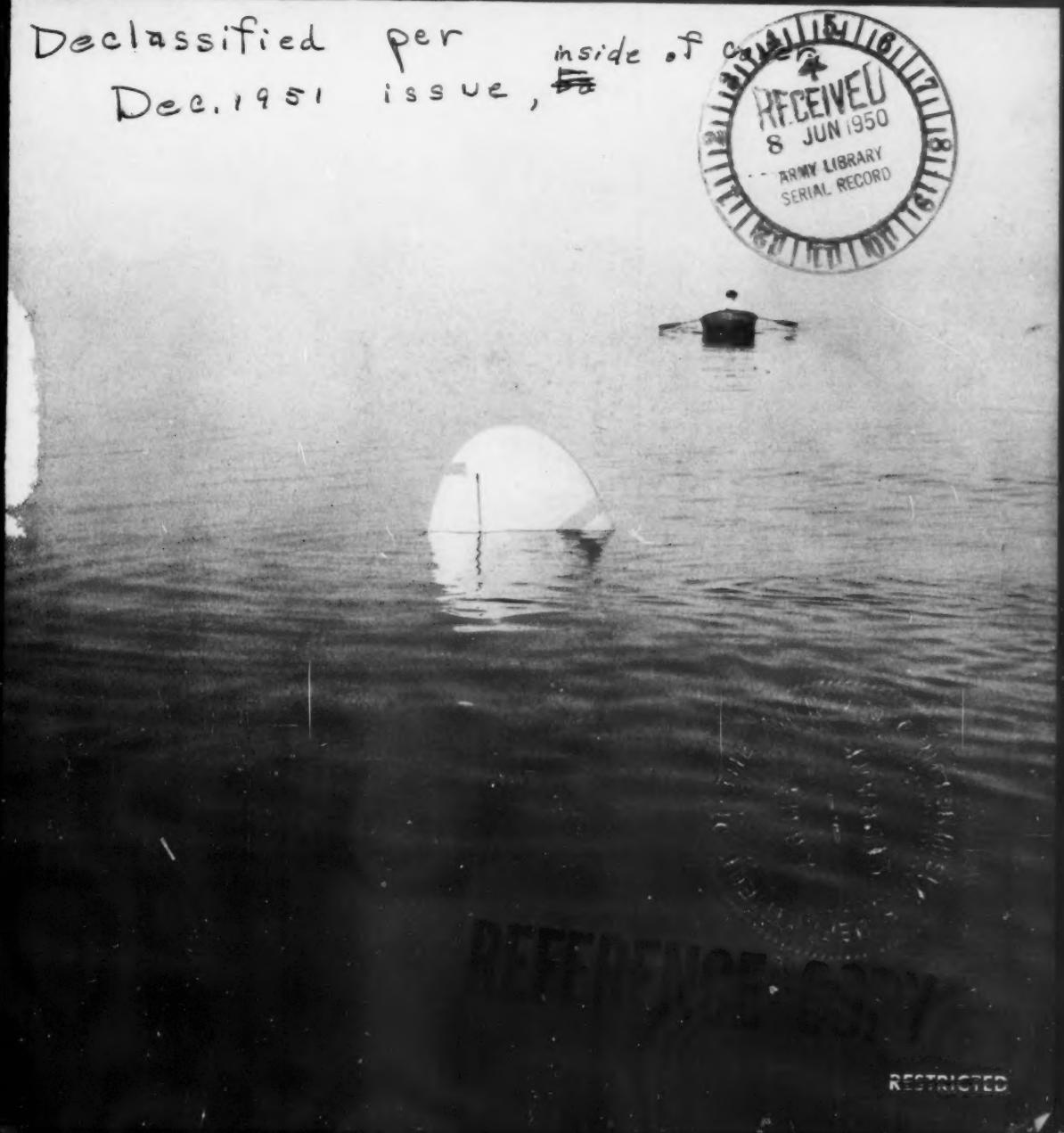

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COVER

An F-84 lost power on takeoff at an altitude of 200 feet. The pilot landed straight ahead and successfully ditched in the ocean two and one-half miles from shore off the end of runway. The plane sank almost immediately but the pilot was successful in extricating himself from the cockpit and was picked up by a crash boat. The plane was totally wrecked.

★

FLYING SAFETY PENNANT AWARDS

For the best records during the Three-Month period ending 30 September 1949.

(Star's denote number of times previously awarded)

B-17
- Green Pennant (2 Stars)—Eglin AFB, Fla. ..... APG
- White Pennant—Clinton County AFB, Ohio ..... AMC

B-25
- Blue Pennant (3 Stars)—Mather AFB, Calif. ..... AFTRC
- Green Pennant—Maxwell AFB, Ala .... AU
- White Pennant—Kelly AFB, Texas .... AMC

B-26
- Green Pennant (1 Star)—Long Beach, Calif. ..... ConAC
- White Pennant—McClellan AFB, Calif. ..... AMC

B-29
- Green Pennant—Walker AFB, N. Mex. SAC
- White Pennant—Muroc AFB, Calif. .. AMC

C-45 (T-11, T-7, CQ-3, F-2)
- Blue Pennant—Hamilton AFB, Calif. ConAC
- Green Pennant—Marietta AFB, Ga. ConAC
- White Pennant—Offutt AFB, Neb. .... SAC

C-46
- White Pennant—Hamilton AFB, Calif. ..... ConAC

C-47 (C-53)
- Blue Pennant (2 Stars)—Wright Patterson AFB, Ohio ..... AMC
- Green Pennant—Hamilton AFB, Calif. ..... ConAC
- White Pennant—Grenier AFB, N.H. ConAC

C-54
- Blue Pennant—Westover AFB, Mass. MATS
- Green Pennant (2 Stars)—Fairfield-Suisun AFB, Calif. ..... SAC

F-51
- Blue Pennant—Bolling AFB, D.C. Hq COMD
- Green Pennant—Maxwell AFB, Ala. AU
- White Pennant—Scott AFB, Ill. ..... AFTRC

F-80
- Blue Pennant (1 Star)—Williams AFB, Ariz. ..... AFTRC
- Green Pennant (1 Star)—Eglin AFB, Fla. ..... APG

L-5
- Green Pennant—Connally AFB, Tex. AFTRC
- White Pennant—Biggs AFB, Tex. ..... SAC

T-6
- Blue Pennant—Scott AFB, Ill. ..... AFTRC
- Green Pennant—Atterbury AFB, Ind. ..... ConAC
- White Pennant—Floyd Bennett NAS, N. Y. ..... ConAC

MISCELLANEOUS
- Blue Pennant—Davis-Monthan AFB, Ariz. ..... SAC
- Green Pennant—Selfridge AFB, Mich. ..... ConAC
- White Pennant—Kirtland AFB, New Mex. ..... AMC

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FLYING SAFETY

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DEPARTMENT OF THE AIR FORCE

The Inspector General, USAF, Directorate of Flying Safety, Langley Air Force Base, Virginia

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AFCFS 19 PD STATEMENT FOR JANUARY ISSUE OF FLYING SAFETY MAGAZINE FOLLOWS

BY THE CHIEF OF STAFF USAF

FLYING SAFETY IS A REFLECTION OF HIGH PROFICIENCY IN ALL OF THE FUNDAMENTAL ASPECTS OF THE ART OF FLIGHT PD IT IS THE MEASURABLE RESULT OF AN ATTITUDE OF MIND CMA SHARED BY PILOTS CMA CREW MEMBERS CMA AND MAINTENANCE PERSONNEL ALIKE CMA THAT COMBINES DISCIPLINE WITH KNOWLEDGE PD

ALTHOUGH THE TASK OF THE UNITED STATES AIR FORCE FREQUENTLY INVOLVES THE ASSUMING OF RISKS TO COMPLETE OUR MISSION SUCCESSFULLY CMA THE PRECISION CMA EFFICIENCY CMA AND RELIABILITY ENGENDERED BY HABITS OF FLYING SAFETY ENHANCE THE PROSPECTS OF SUCCESS PD IN THE YEAR AHEAD WE MUST CONTINUE OUR EFFORTS TO MAINTAIN THE DOWNWARD TREND OF THE ACCIDENT RATE AND CMA THROUGH THESE EFFORTS CMA HELP TO MAKE OUR AIR FORCE THE FINEST POSSIBLE INSTRUMENT FOR THE AIR DEFENSE OF THE NATION SIGNED VANDENBERG

END

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. . . the men from

THIS MONTH the great separator comes into his own again. Old Man Winter Flying Weather settles down in earnest in January to his annual job of separating the men from the boys. If he runs true to form he'll kill off a flock of the boys in the process, and he'll build a pile of wrecked aircraft that would take half a day to climb.

Last year 188 people died in winter flying accidents. Can we expect any great improvement in that record this year?

The old separator has a lot of little helpers among pilots, supervisors and air installations people. Pilots who fail to make proper preparations for winter flights and fly into known icing conditions without proper anti-icing equipment, supervisors who fail to monitor flights and airport conditions properly and installations people who fail to anticipate and eliminate winter hazards on their bases all contribute to the winter accident rate. Pilots make up the largest portion of the group.

Poor judgment on the part of the pilot is the cause factor which appears most frequently on winter pilot-error accidents. Poor judgment can be a lot of things.

The B-29 pictured on opposite page ended up in the position shown because the pilot exercised poor judgment. One chilly January morning the pilot took off on an instrument calibration flight from a midwestern airbase. The weather was good, ceiling 12000 feet broken with visibility 15 miles.

One hour later, however, the weather forecaster on duty at the base advised operations that instrument conditions were developing. The tower was instructed to call the B-29 back to the base immediately. Fifteen minutes after his first advisory the forecaster notified operations that the visibility was down to one and one-eighth mile in blowing snow. During this period the tower had been trying to contact the B-29 but was unable to do so because no one aboard the plane was standing by on tower frequency. Another ten minutes passed before the B-29 was finally contacted. The pilot reported his position as 15 miles north of the field. On the advice of the forecaster, the tower advised the B-29 to proceed to another air base where weather conditions were good.

However, the pilot stated he had the field in sight and would land instead of proceeding to the other base. On the final approach the pilot lost contact with the field and had to pull up and go around. The tower again advised him of weather conditions. The pilot said he was going to make another attempt to get in before going to the other base.

On the final approach the pilot again lost contact at an altitude of about 75 feet. He attempted to apply power for another go-around, but about this time the plane hit the ground 250 feet short of the runway. It veered to the right and rolled 700 feet where it plunged into a snowbank and the right gear collapsed. Fortunately, no one was injured seriously as a result of this pilot's poor judgment.

The cause of winter accidents is invariably not the poor weather itself, but the failure of pilots to cope properly with conditions caused by winter weather. The Alaskan Air Command last winter proved that winter flying conditions need not cause accidents. For the entire winter not one single accident in Alaska resulted from weather as principal cause.

The mark that distinguishes the men who do not have winter accidents from the boys who do have them is the ability to adapt themselves to changed conditions. A pilot who goes into winter flying with only the same amount of preparation, forethought and planning that he exercises before a VFR summer flight immediately classes himself among the boys. His chances of joining the old Separator's death list for this winter are very good.

Then there are the winter accidents that must be laid at the supervisors' door. The forlorn C-47 minus the prop shown in the pictures was involved in just such an accident. This accident might not have occurred in summer weather because the degree of supervision exercised by the pilot's supervisors, although inadequate, would probably have been sufficient for summer flying. The extra haz-

nhe boys

ards brought on by winter were sufficient to show up this case of poor supervision.

The pilot had only recently transferred. During the 30 days just prior to the accident he had flown a total of two hours and 20 minutes during which time he was checked out in the C-47 at his new station. The day after he checked out he was authorized to make a long cross-country flight which ended in the accident.

The flight which ended in the accident had been a night VFR flight. On the final approach to the field which had no control tower, the pilot turned on his landing lights and observed a ground haze or fog along the runway. As he went into the fog visibility dropped to zero and the pilot attempted to go-around. The plane stalled. The pilot attempted to reduce power and let the plane settle in but inadvertently reduced only the right throttle leaving the left throttle forward. The plane struck the ground on the right wingtip and gear, skidded off the right side of the runway into heavy snow and collapsed the gear. The plane was hastily abandoned.

Investigation right after the accident revealed that in his pre-landing check the pilot had not advanced props in order to be prepared for a go-around. The elevator trim was found in the full nose high position.

The investigating board recorded an opinion that the pilot's brief check-out prior to dispatching him on a long cross-country flight was entirely inadequate.

Personnel charged with keeping runways free of snow and marking drifts and other danger areas cause their share of winter accidents. The F-51 resting belly-down in the snow was wrecked when it hit an unmarked snow drift on the runway during a night take-off.

The pilot had completed his pre-takeoff check and started his take-off roll. As he lifted the tail the plane veered slightly to the left but the pilot immediately straightened it with rudder. However, since a strip only half the width of the runway had been cleared down the center and a four-foot snow-bank extended onto the runway some 75 feet inside the Bartow lights on the left side, this slight veering of the plane was enough to put it in line with the drift.

When the plane hit the four-foot drift which was not marked with flare pots and so was not visible to the pilot, the main gear and air scoop were sheared off.

The reduction of winter accidents must be a teamwork proposition. Anticipation of and thorough preparation for the increased hazards of winter operations on the part of everyone concerned with flight operations should be the first step. For the pilot that means careful preparation for each flight, a thorough weather briefing and constant enroute checks on the weather, a high level of instrument flying proficiency and a healthy respect for the hazards that winter can unexpectedly toss in his path. For supervisors that means a constant watchfulness over all factors that constitute hazards to winter operations and a rigid enforcement of safety requirements.

Adherence to such a policy can result in a great reduction of winter accidents. How well such a policy is carried out depends upon the actions of each individual concerned with winter flight operations.

WINTER CHECKLIST

By CAPT. C. C. NAPIERKOSKI, ELMENDORF AFB, ALASKA

BEFORE TAKE-OFF

1. WEATHER. Know the whole story for the whole route.
2. BRIEFING. Make sure all aboard have the equipment they're supposed to have and know what they're supposed to know.
3. YOURSELF. Make sure your pre-flight planning, equipment and physical condition are right.
4. YOUR PLANE. Give it the old "fast 50-hour check." Check everything you would in summer then begin on the winter items. Check deicers and anti-icers. Check isoprophyl supply. Check pitot heater. Check emergency equipment. Check for wing frost and eliminate it. Check all radio and navigation equipment. Get a battery cart if weather is very cold. Check engines including carburetor heat carefully. Check with tower on length and width of cleared runway.

IN FLIGHT

1. WEATHER. Keep ahead of the weather all the time. Know what you're running into and be ready for it.
2. PLANE. Turn on prop isoprophyl before you enter icing conditions and keep it on. Same for pitot heat. Watch carburetor temperature. Watch for wing ice. Let it build up to one-fourth to one-half inch before turning on boots. Don't turn them on at all until you break out of the icing if you don't have to. If your props ice up throw it off by surging props.
3. RADIO. Give a position report every time you pass a station. Give a PIREP also. Thirty minutes out from destination memorize letdown procedure. Have co-pilot hold the book and be ready to do everything but handle the controls. Two can make a better letdown than one.
4. FINAL APPROACH. Turn off boots. Be ready for go-around. Co-pilot watch cylinder head temp. Don't let it get too low. After touchdown lay off the brakes on icy runways. Get a tug if things are too slippery or wind is strong.

POST FLIGHT

1. PLANE. Put her to bed right. Wing covers, wheel covers, tie down, oil dilution, brakes unlocked, wheels chocked.
2. WEATHER. Have a chat with forecaster. Tell him all you can about the whole route. It will help the next guy. Tomorrow he may be helping you.

START NUMBER SIX

When a B-36 crew reports at their airplane the preflight inspection and starting procedures take the form of a ceremony on safety. But none of it is just for show. In the photo left center, the airplane commander carefully inspects each crew member's personal equipment before the team boards the bomber. Although the six-engine plane has reversible props which would suggest taxiing aptitude, special tugs (lower left) are always used to safely maneuver the huge craft on crowded ramps. Starting B-36 engines calls for new procedures. Photo upper left shows member of ground crew with interphones plugged into airplane which connect him with the flight crew. He gives the signal to start each engine and a running commentary on how each engine is turning over. In place of hand-cart fire extinguishers, a full scale fire truck with crew stands by as fire guard (below) while engines are started.

OUT OF GAS

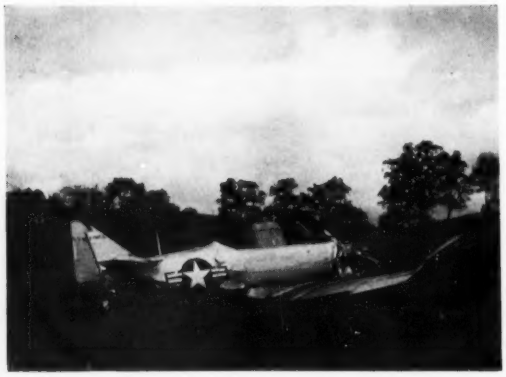
If Flying Safety ran a column each month on "My Most Embarrassing Moment," pilots who have to make forced landings or bail out because they run out of gas would keep us supplied with material.

Out-of-gas accidents continue to make up about two and a half per cent of the total Air Force accident picture. It's a small percentage, but it's a lot of dollars. When you toss a dozen or so trainers and fighters and an assortment of transports and four engine bombers on the scrap heap each year purely as a result of pilot negligence, it is a serious situation. And the big majority of out-of-gas accidents are the result of pilot negligence pure and simple.

The key to the lack of judgment and absence of technique on the part of pilots who have to crash land or abandon airplanes for lack of fuel is the inevitable assortment of excuses they offer for their actions. Unexpected headwinds, unusually high fuel consumption and inaccurate fuel gages are the three most common swan songs. The accident board which accepts such excuses is as guilty as the pilot who offers them.

Whose responsibility is it to keep track of his groundspeed and so recognize unpredicted headwinds? Who should make it his business to keep an accurate check on fuel consumption? Who is supposed to check fuel visually before takeoff to make sure tanks are full? And who is responsible for practicing cruise control when it is necessary to get the greatest possible range from an aircraft?

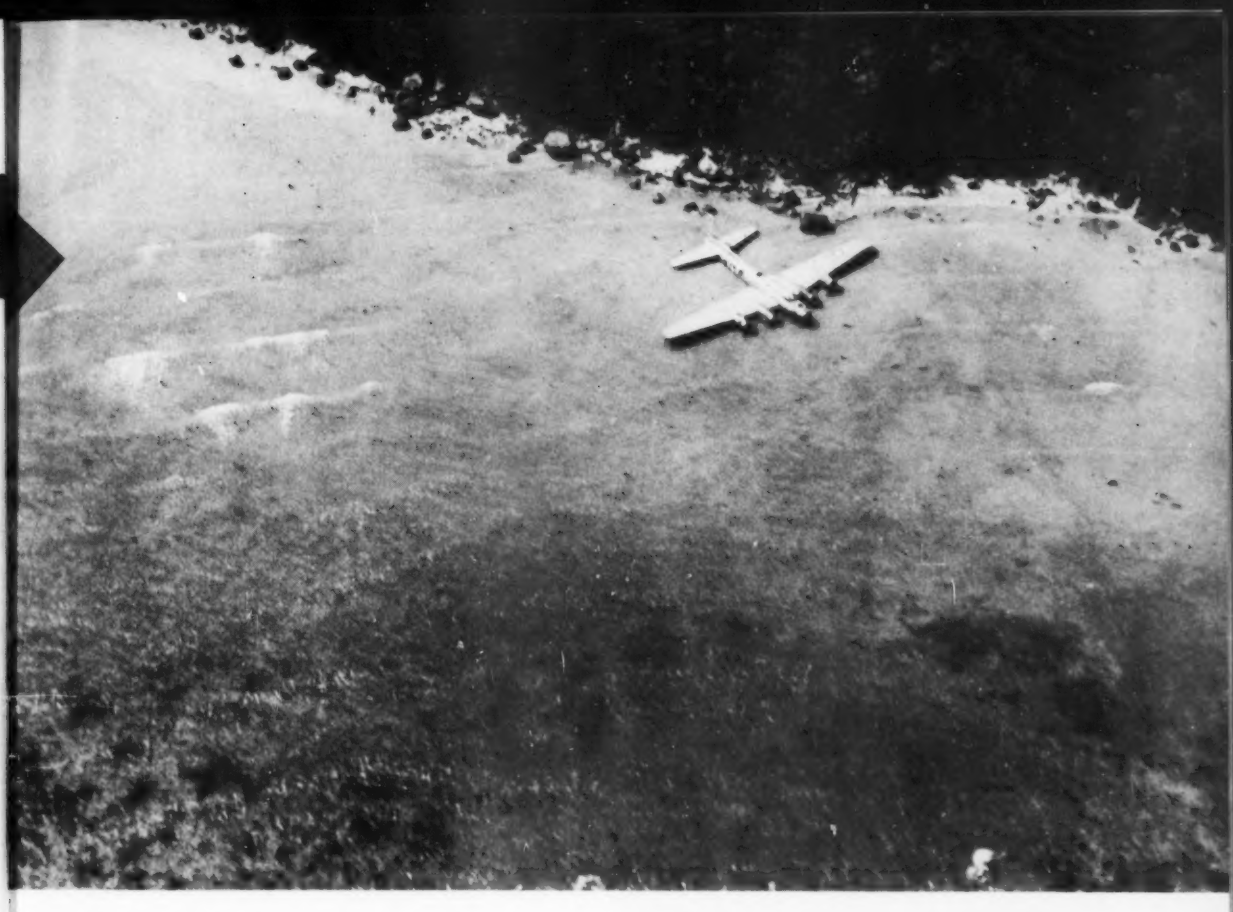
Many out-of-gas accidents are the result of improper pilot technique in phases of flight other than proper cruise control procedures. The pilot of the T-6 in picture below bailed out at night when he got lost and ran out of gas looking for an airport. He had filed an IFR clearance estimating an hour and ten minutes enroute with two hours and ten minutes of fuel aboard. The pilot relied on navigation by radio compass homing only, although he knew his compass was sometimes inaccurate. He became lost in the vicinity of his destination when the compass needle did not lead him over the range station. He was VFR during the latter portion of his flight. Although he was receiving the station on both command and radio compass he did not work an orientation problem but wandered about for an hour trying to home on different radio stations until he ran out of gas.



The pilot of the B-17 resting in the water in picture next page became lost near his destination after a long over-water flight. After eight hours of flight the pilot picked up a weak range signal from the range at his destination. He continued on the heading his navigator had given him until the navigator told him he was 100 miles out, at which time he decided to complete the flight by flying the radio range.

The pilot flew a series of headings attempting to get a build or fade without success. A QDM was requested but could not be obtained. The pilot then attempted unsuccessfully to get a radio compass null. During the time spent trying to orient himself by radio the pilot made no attempt to utilize reduced power settings to save fuel. A QDM was finally received from the base at destination, but due to inexperience of communications personnel who were not trained in QDM work, the heading was erroneous. The pilot flew the heading for one hour until he was given a new QDM heading 150 degrees off the first one. By this time the engines were cutting out from lack of fuel and the plane was ditched.

The investigating board found that the inaccurate QDM's contributed to the accident. However, the board stated that the accident would have been averted if the pilot had flown out his ETA before attempting a radio orientation or if the pilot had made a proper orientation at the time he did attempt it. The board also noted the pilot's

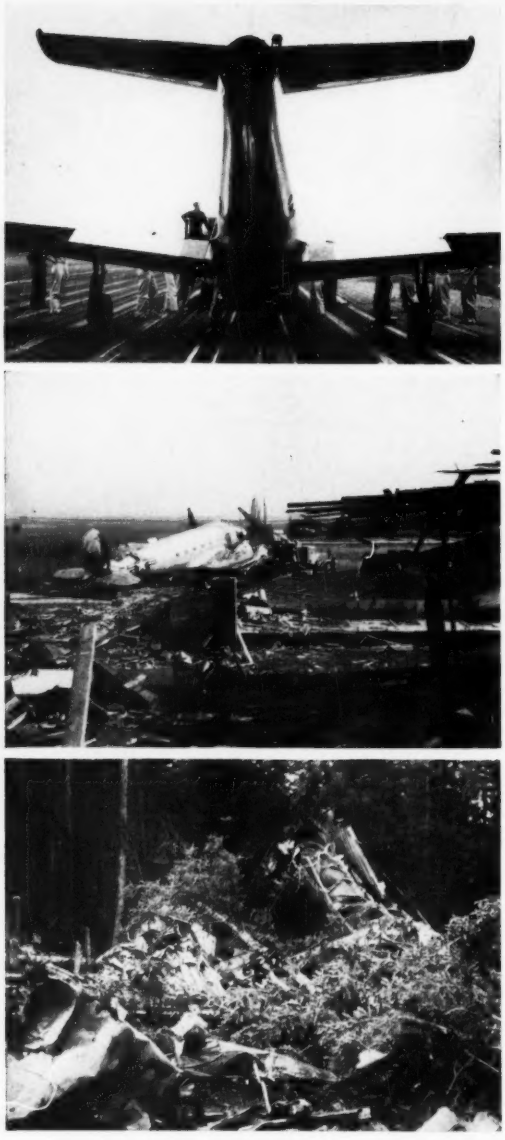


failure to utilize maximum range power settings when he first found himself in difficulty.

Failure to keep track of fuel gage readings is an inexcusable cause of out-of-gas accidents. The pilot of an F-84 which ended up ungracefully on its nose was on a local four-ship camera gunnery flight. During the gunnery practice the main fuel tank warning light came on, but the pilot disregarded the fact that this light does not come on until there are only 75 gallons of fuel remaining in the main tank. He did not notify the flight leader that his warning light was on or make a check of circuit breakers to determine if there was a malfunction of the fuel system. At no time after the light came on did he check his fuel gages.

Immediately after peel-off in the landing pattern the pilot experienced a flame-out due to fuel starvation. He called the flight leader and told him to get out of the way and continued his pattern. The pilot made the runway successfully and his carelessness in neglecting to check his fuel might not have come to light except that the nose gear on his F-84 did not lock down and the plane slid to a stop on its nose and the main gear. Investigation disclosed that the circuit breaker for wing tanks either popped out during flight or was left out by maintenance personnel before takeoff. The pilot's inability to utilize all his fuel would not have caused trouble, however, if he had kept a check on his fuel and heeded his warning light. He would have had plenty of time to make a normal approach and put his gear down properly if he had returned to base when his warning light first came on.

Accidents are sometimes caused by pilots who list more fuel aboard than they actually have in order to obtain flight service approval of a clearance to a distant base. Such lack of judgment combined with inability to fly GCA killed the pilot of the C-47 in picture on next page and took the lives of three other men who were aboard. When the pilot arrived over his destination he was informed that the weather was below GCA minimums. However, the pilot stated he had insufficient fuel to proceed to an alternate and would attempt a GCA



landing anyway. He went so far below the glide path on the final approach that he ran clear off the controller's scope, despite repeated instructions from the controller to pull up. The C-47 struck an empty building and crashed nearly a mile short of the runway.

A crowning example of negligence on the part of pilot and co-pilot resulted in a B-17 cutting the splintered swath through the trees in the picture above. This flight was a total "snafu." The crew took off from a mid-western air base for a flight to the West Coast. Radio trouble was encountered on the flight, but no attempt to have the radios repaired was made after the plane landed at the West Coast air base. The pilots were informed that the base could not supply them with fuel, but after a hasty computation they decided they had enough gas to return to their home station anyway. They estimated they had eight hours fuel aboard when they actually had only about five to five and one half hours of fuel as was later determined.

A clearance was filed via airways across the mountains and the plane took off. About half way home the pilots decided they did not have as much fuel as they had originally thought so they changed their plans and took up what they thought would be a direct course from their position at that time to their destination. Although the clearance had been filed via airways, flight service was not advised of this change of route. The route across the mountains off airways required flight at 15,000 feet. The pilot alone had an oxygen mask.

Because they had not had their radios repaired when they landed on the West Coast the crew was unable to navigate by radio and had to depend on night dead reckoning across the several hundred mile stretch of wild mountain country. They flew a heading they *thought* would take them home but which actually would have taken them approximately 150 miles to the right of their destination. Take-off had been made at 2200. At 0330 the engines quit from fuel starvation and the crew bailed out 143 miles southwest of their destination. The two pilots went first, and the radio operator and engineer followed. The co-pilot received a broken ankle on landing. The radio operator suffered a bruised groin as the result of a loose fitting parachute harness.

There were four violations of AF Reg 60-16 in this one fiasco—improper use of oxygen, improper fitting of parachute harness, departure with insufficient fuel for flight and insufficient radio equipment for night flight. Both pilots met a flying evaluation board and were suspended from flying.

Except in certain cases of mechanical failure, accidents caused by pilots, allowing their planes to run out of gas are inevitably "pilot error" accidents and make the pilot liable to appropriate disciplinary action. It is only common sense that all pilots should check their fuel before each takeoff and maintain an accurate account of fuel consumption on all flights. It is a small part of pilot technique, but one that will save the Air Force millions of dollars and the individual pilot great embarrassment.

MINOR ACCIDENT—MAJOR THRILL

LAST YEAR there were eight reported cases of lightning striking Air Force planes in flight. Two accidents in which lightning was recorded as a probable contributory factor resulted in the death of nine people. However, these two accidents both occurred in severe thunderstorms where lightning was only a part of the pilots' worries.

One graphic account of lightning striking a B-17 which was making a flight from Guam to the Phillipines illustrates the danger that may be encountered when lightning strikes a plane in flight. The navigator of the plane described the incident.

"I was looking out of the nose of the plane when I heard a terrific blast and saw the blinding flash of light. The sound was like that of a German 88 MM bursting right under me. That is just what it sounds like when your airplane gets struck by lightning!"

The crew chief said his first thought was that one of the propeller blades had come off and hit the plane.

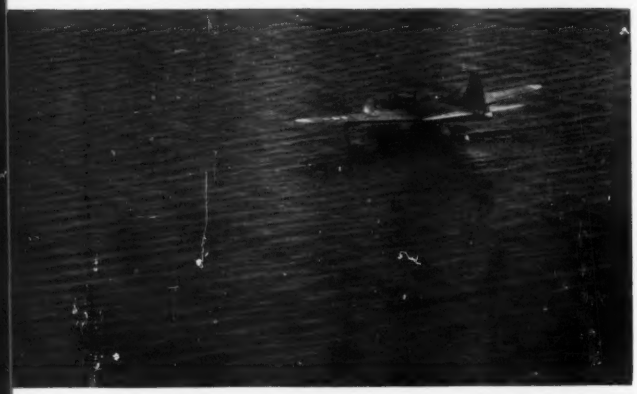
The plane had been cruising along at 10,000 feet through a solid blanket of gray rain. For four hours before the lightning struck, the pilot had been on instruments.

Apparently, the charge of electricity entered the nose and scorched its way back to the tail section. Although the nose section is protected by a center panel of one-inch glass, this section was splattered as though a hammer had smashed it. Fire danced all through the airplane. When the charge departed the tail section it left a series of pock-mark holes all through the tail gunner's compartment, some of which were three-eighths of an inch in diameter. The under section of the tail assembly was burned black by the heat.

It was a hot spot for the crew to be in, for they were left with no radio equipment. The lightning burned off most of the antenna connections. Some of the control cables were scorched. The crew feared part of the nose section might fall off; therefore, the throttles were pulled back to reduce the airspeed and an "in-the-air repair job" started. Upon arrival at Clark Air Force Base, the crew aboard the limping B-17 were glad to find clear weather conditions prevailing.

After a normal landing at Clark AFB, the B-17 with the burned nose and tail was wheeled into the hangar for repair. The accident was pronounced as minor, but it certainly was a major thrill for all those aboard.

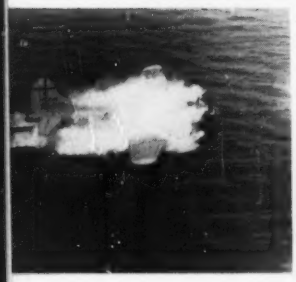
DELIE

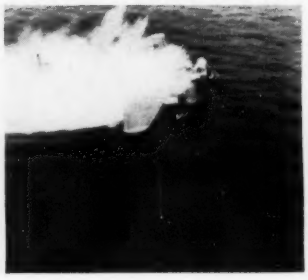


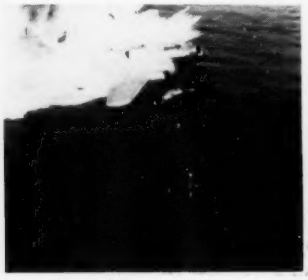
THERE ARE some people who would say that deliberate destruction of several million dollars worth of equipment is a rather odd way to save money. The Air Force has done just that—and hopes to save money and lives by having done so.

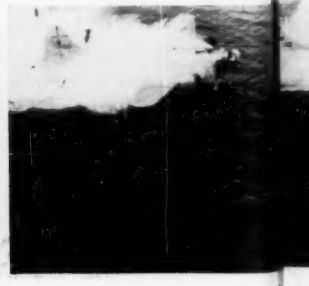
As long as aircraft are to be operated over large bodies of water the possibility of an emergency landing in the water or a "ditching" is a potential hazard. Considerable experience in ditching was gained from operations during the recent war and a great variance in the ditching characteristics of the various airplanes was noticed. Although many theories have been advanced concerning the reason for this variance, none of them has proved feasible; therefore, it has not been practical in the past to establish design criteria which would insure that airplanes designed in accordance with these criteria would be "safe ditchers."

The obvious means of determining the ditching characteristics of an airplane is by means of actual ditching tests of the complete airplane. However, this method has three distinct disadvantages. First, such tests, conducted on the complete airplane, would be too late to enable the information obtained in this manner to be effective in making any major changes to the aircraft. Second, an investigation of all of the variables such as waves, wind, airspeed, rate of wind, attitude and flap position would require many tests. Each such test would require the









IERATE DITCHING

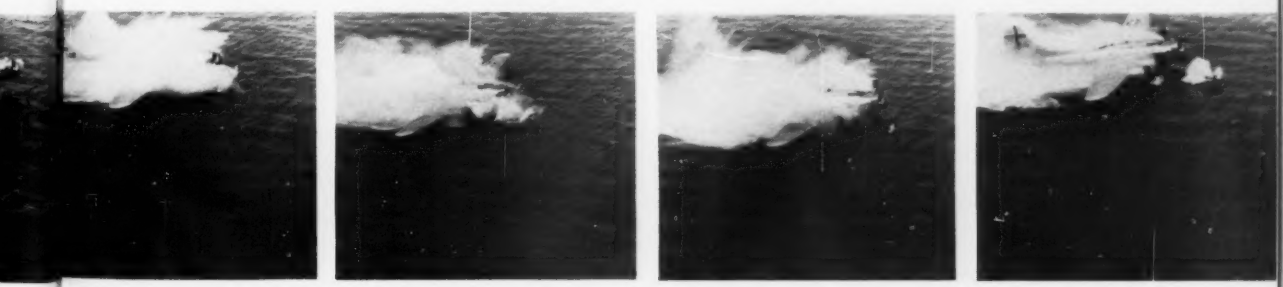
destruction of the test airplane. Thus, a considerable number of first airplanes would be destroyed. The third disadvantage is obvious. Large expenses in money, manpower, and time would be required for installing the required instruments and equipment and performing the tests necessary to investigate characteristics of each airplane, aside from the cost of the airplane itself.

The solution to these problems is the performance of the tests by means of scaled models. However, the Air Force did not have the necessary correlation between model and full scale ditching data so it was decided that 11 B-17's would be ditched in Choctawhatches Bay near Four-Mile Point off Eglin AFB, Florida. After these were completed, scale models were to be ditched and the data gathered correlated. From these tests it was hoped that the correlation of data between full scale and model ditchings would be proved, and that suitable criteria for the design of aircraft to make them safe for emergency water landings would be obtained. Certainly there exists a need for this information and an adequate means of determining the ditching characteristics of a given airplane design. Both of these needs could be satisfied by appropriate model tests if the correlation between model and full scale ditching information were adequately proved.

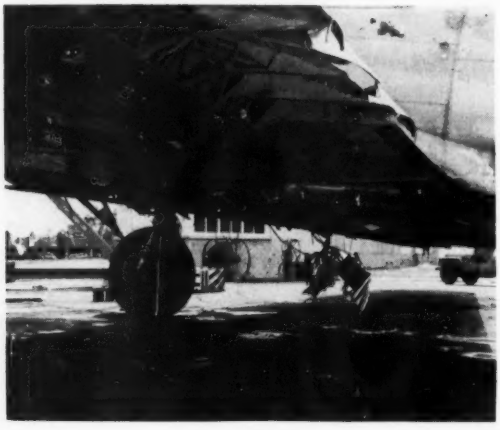
Sufficient model tests could be conducted to evaluate the effects of the various factors on the ditching behavior and thus instruct the airplane designer on the best method for use in the design of his airplane. After the airplane design had been completed, appropriate scale models could than be constructed of that design and the necessary tests be conducted to determine in advance of fabrication of even the first experimental planes whether or not that airplane would be dangerous if landed in the water. If poor ditching behavior was indicated, corrective measures could be taken early in the design stage and by successive modification and retesting, the airplane could be made safe for emergency water landings. Thus we see how the Air Force hoped to save money by actually ditching B-17's and most of their allied equipment.

The B-17 was used as a test vehicle *NOT* for the purpose of studying its ditching behavior, but because the ditching behavior of this airplane offered a maximum of protection to the data gathering equipment. The good behavior of the B-17 and its resultant tendency to remain intact during a ditching also increased the possibility of correlation with model data since a model is inherently stronger than the full-scale airplane. Also, B-17 airplanes were readily available from surplus stocks and the techniques of installing radio-control equipment and of remotely controlling this type of plane were well advanced.

Standard "drone" radio-control equipment (simi-



Above. Hoisting one of the ditched B-17's from water.



Above. Damage to flaps.
Below. Damage to horizontal stabilizer.

lar to that used on Crossroads atomic tests) was installed in the test airplanes at the Rome, N. Y., Air Depot. The installation of the instruments with their protective tanks was planned and performed by the Curtiss-Wright Corporation in accordance with instructions from the Engineering Division, AMC. The test airplanes were flown remotely by pilots from the First Experimental Guided Missiles Group of the Air Proving Ground. Other facilities of the APGC such as transportation, both land and water-borne, and salvage equipment were used in these tests.

The instruments which were installed in the test airplanes consisted of a photo-observer, a 30 channel recorder and nine motion picture cameras which photographed the structure of the bottom of the fuselage. The data from the instrument panel of the photo-observer were transmitted by means of television to one of the water-borne radio-control stations for information of the pilot controlling the attitude of the airplane in landing. The accelerations and hydrodynamic pressures as applied to the fuselage during the test were recorded on an oscillograph. The structural damage as recorded by the motion picture cameras is to be mechanically synchronized and will be correlated with the hydrodynamic pressures and accelerations.

All of the instruments were inclosed in watertight compartments or tanks for protection from the water. The majority of the instruments were started automatically when a wand extending from the fuselage near the tail struck the water.

The airplanes were weighed and ballasted to a

Damage to bomb-bay doors.

gross weight of approximately 45,000 pounds with the center of gravity at approximately 28 per cent of the mean aerodynamic chord.

Although it was planned that 11 B-17's would be ditched, a shortage of funds temporarily terminated the project after the seventh ditching. "But," said the project engineer, "we have learned a great deal from these seven ditchings."

One of the things he felt had been proved by the project is the theory that all airplanes should be ditched in a normal landing attitude. "We found," he said, "that in the normal ditchings, the decellerative forces average approximately two G's with peaks to four or five G's. Normally, greater forces than these are required to kill crew members so we are led to believe that flying debris or drownings are responsible for most of the deaths connected with ditchings. Persons may be trapped in a sinking portion of a plane that has been ditched and be drowned before escape can be accomplished. We believe that greater emphasis must be placed upon easier escape." As he put it, greater strength in the airplane fuselage is not needed.

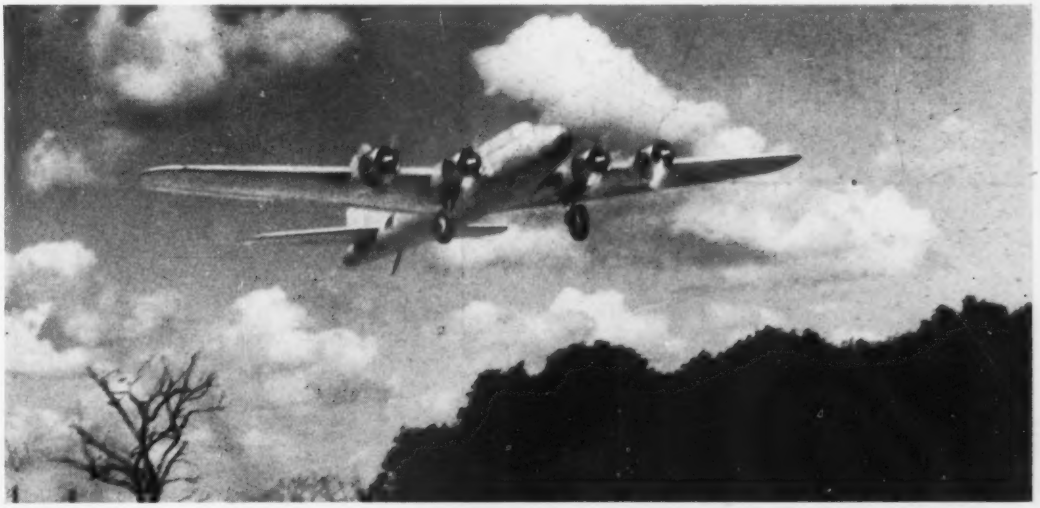
During these tests, it was found that there was damage from water going out of rather than into the airplane. This resulted from the skin peeling off the bomb bay doors and allowing water to rush in and out of the bomb bay. When the leading edges of the bomb bay doors were sealed this trouble was reduced appreciatively if not eliminated entirely. "Therefore," said the engineer, "we believe that all planes that are to be operated over large bodies of water where ditching is always a possibility must have the leading edges of all doors or other openings sealed. We believe that we can improve airplanes without adding weight as a result of the data gathered during these tests. That is what we hoped to do."

A shortage of funds terminated the project for the present but not before a one-seventh scale model of the B-17 had been built and flown by AMC. It is believed that only one model of each type airplane to be tested would be all that is needed since it is hoped that damage to the model will not be so great that it cannot be repaired. Just when the ditching of the model can be accomplished is anyone's guess.

The total cost of the one-seventh scale model was estimated by AMC personnel to be about $20,000. If there is any correlation between the data gathered from ditchings of the full scale and model planes then it is easy to see how much money could be saved by building a model of a newly designed airplane and running tests upon the model rather than the full scale plane. If it proved to be a poor design, the taxpayers would be saved the expense of fabricating a full scale plane.

When asked what was the most important point learned from the seven ditchings, the project engineer replied, "All the information is good, but if there is one point that is more important than the others then it must be the one concerning the ditching in a normal landing attitude. We stalled in B-17's, flew them in at speeds above their normal landing speed, and landed them in their normal seven degrees nose-up attitude. In all cases, damage to the airplanes was greater when they were landed in any attitude other than normal."

One-seventh scale model of B-17 built by AMC.



"SOOT'S

EVER SINCE pilots and crew members started riding on the inside instead of the outside of airplanes, military aviation has been plagued with the crash fire rescue problem.

At first, when pilots rode out in the open, a long pole with a hook on one end was usually ample equipment to release a safety belt and drag the individual to safety in case of fire.

Not so now! Airplanes have become more and more complicated to get in and out of. Today, when a fire breaks out after a crash landing, it is often necessary for crash crews to open canopies or go right into fuselage compartments to get to personnel who cannot help themselves. Once on the inside, the fire fighter is confronted with the problems of operating in confined spaces, removing parachutes, Mae West's, safety belts and other equipment before it is possible to move injured personnel. All of these take up precious time often making it necessary for the firefighters to remain in the flaming wreckage for extended periods of time.

From January through June 1949 there were 277 emergencies where crash fire fighting equipment was called out. Of this number, 49 were fires which were extinguished and 19 lives were saved by the speedy action of the crash fire fighting crews.

But many of these fires have been fought with sheer bravery and guts, rather than with adequate equipment. Take the case of Sgt. Thomas H. Purl who with utter disregard for his own safety, dashed into the flaming wreckage of an F-47 and after one unsuccessful attempt, finally with the aid of a penknife cut the pilot's belt and dragged him from the wreck. Sgt Purl's only protection was water sprayed on him from fire hoses handled by other fire fighters. (Photo lower right.)

To cope with situations such as this and to afford fire fighters adequate protection, a suit designed to keep aircraft crash crewmen from becoming "medium-well' while working in a flaming inferno of gasoline and oil at a sizzling 2000 degrees has just been tested successfully by the Engineering Division of AMC at Wright-Patterson Air Force Base.

The only suit of its kind so far developed, it is made of 18 layers of glass fiber, honeycombed cotton cloth, silver foil, aluminum foil and nylon.

In all, the suit is only about one-half inch thick, providing the lowest possible bulk and weight consistent with its insulating qualities. The material is capable of withstanding abrupt and extensive changes in temperature without the loss of physical properties, and contains nothing which can be deteriorated by water, oil, common solvents, fuels,

SUITERS

lubricants, or firefighting agents.

During the recent tests the volunteer fireman, wearing the protective covering shown in the accompanying illustrations, remained in a wall of flame at 2400 degrees for one minute and 32 seconds without experiencing any bodily discomforts whatever. The knowledge gained from this test indicates that the wearer could remain completely surrounded by 2000 degrees of heat for as long as ten minutes. After that length of time it would be necessary to withdraw from the flames to cool the suit even though the body temperature might still be comfortable.

Records prove that firemen usually are required to remain in the flaming area for only three minutes at any one time when rescuing entrapped personnel.

The new apparel consists of a one-piece coverall, a hood, mitten-type gauntlets, and asbestos soled boots of the 18-layer material and has a total weight of approximately 29 pounds. The mittens are made of slightly lighter weight material than the rest of the suit because of the greater heat tolerance of hands and the need for hand dexterity. The head and body are completely enclosed to protect the respiratory system against external heat, flame, and hot, noxious gases. Because this limits the amount of breathable air inside the suit, the fireman wears a bottle of compressed air strapped to the shoulder blades or to the chest. Another protective feature is a layer of material near the surface, and another near the skin, which cannot be permeated by gas or liquid. A blanket of the same material as the suit is provided for protection of the person being rescued.

During an actual aircraft crash fire the new "soot" suits will be worn by four members of the new 20-man fire fighting teams recently set up by the USAF. The four men will work in pairs to rescue trapped personnel from wreckage, while the remaining 16 firemen will act as structural fire fighters. Structural firemen will wear suits of aluminum foil laminated on glass cloth which is highly effective in reflecting heat. The foil suits are not suitable for actual entry into the flames because they do not offer sufficient protection against conductive heat, but their shiny surfaces have been found superior to all other types of material in providing protection against radiative heat.

With this new equipment, the hazards of fire fighting will be minimized. Because of the time element involved, the risk will be lessened considerably in the future and rescues will be completed before exploding bullets, cannon shells, rockets and gasoline would otherwise make rescue an impossibility.

A PAT ON THE BACK

HALF OF ALL the aircraft accidents in the Air Force during the 12 months ending 31 August 1949 occurred during the approach and landing phase of flight. Emergency landings caused a considerable portion of these accidents.

However, at the same time that some pilots were cracking up in emergency landings, other pilots were getting their planes down in emergency landings with only nominal damage or no damage at all. Because executing an emergency landing is at best a little more ticklish and dangerous than normal landings FLYING SAFETY feels that pilots who do make them successfully deserve a "pat on the back."

For instance, Aviation Cadet Wallace F. Simpson and instructor pilot 1st Lt. Sterling P. Gaffield of Perrin AFB, Texas receive a nod for following safe procedure to the letter. They had reached an altitude of 5,000 feet and were approximately 25 miles from the field on a routine flight in a T-6 when the engine began to cut out. Cadet Simpson with only six hours of dual instruction, kept his head and followed the rapid fire orders of his instructor to a "T."

The instructor re-set the mixture adjustment, and the engine caught for a few minutes during which time the plane was headed back to the field. The fuel pressure then dropped to zero, and Cadet Simpson worked up pressure with the wobble pump, while the selector was changed alternately to all tanks. During this period the engine would catch for a few seconds and then cut out. Calmly the instructor called out the forced landing procedures which the cadet completed. The May Day call was given to the tower at approximately 10 miles from the field. Gliding in with no power at all the instructor made a normal wheels-down landing. Cause of the engine failure was not definitely determined.

Flying an F-51 over the ocean with only momentary bursts of power which were gradually growing shorter would make any fighter pilot old before his time. 1st Lt. Emory E. Hodges, 8th Fighter Squadron, 49th Fighter Group met and overcame this emergency successfully, however. He took off on a routine rocket and gunnery mission as fourth man in a four-plane flight. After expending his rockets in a normal manner, he joined his flight over the ocean to make a visual check for hung rockets. While this was being accomplished, Lieutenant Hodges switched his fuel selector valve from "fuselage" to "left main."

A short time later while he was approximately seven miles out to sea at 3,500 feet, his engine cut out abruptly. Immediately turning toward shore he called the flight leader and notified him of his difficulty. A complete cockpit check and the standard emergency procedures were used without success. Discovering that by retarding the throttle, switching gas tanks and then advancing the throttle he could obtain a brief burst of power, Lieutenant Hodges believed that he might possibly reach shore and make an emergency landing.

As the F-51 crossed the shoreline, the bursts of power were progressively shorter until finally the engine quit entirely. He established a glide with his remaining altitude in the direction of an emergency airstrip. The strip, some two miles inland, was 1800 feet long with about 500 feet of steel matting extension, overgrown with weeds, at each end.

When he was sure that he was within reach of

1st Lieutenant Hodges' F-51

1st Lieutenant Basham's B-26

he strip, Lieutenant Hodges lowered the gear, cut he switches, and came on in. The wheels touched just beyond the overrun. Since he had been forced to land downwind the 20-mph tailwind made very heavy braking necessary. The plane nosed up momentarily, nicking the prop, and the tires and brakes were worn excessively. However, the plane was brought to a halt just beyond the end of the overrun, preventing extensive damage to the airplane, and possible total loss. A U.R. was submitted on the engine.

On a recent simulated instrument flight in an F-86 2nd Lt. Clement L. Bittner, March AFB, California, earned a "hats off." After approximately 40 minutes of instrument practice during which he had been the safety observer for the flight, he was told by the flight leader to join formation and advance throttle to 96 per cent. As he was joining, he had to reduce throttle to 85 per cent to keep from over-running the leader. He slowly advanced the throttle to 90 per cent at which time he heard a slight explosion. Rapid deceleration was noticed on the tachometer. The tailpipe temperature dropped to almost zero. The throttle was immediately shut off.

Notifying his flight leader of his predicament, Lieutenant Bittner turned his radio and all electrical equipment off in order to conserve his battery. At 20,000 feet he turned the radio on again and notified the tower of his difficulty. After draining fuel from the tail pipe he attempted to start the jet engine. The fire started, but RPM would not increase above 20 per cent. Additional starting attempts were made at 15,000 and 10,000 feet without success. By this time the runway was within reach. Lieutenant Bittner lowered the landing gear just over the end of the runway at 6,500 feet, manually pumping the nose gear down. He flew his accustomed 360-degree approach and made a good landing.

One B-26 is flying again because of the quick thinking and action of 1st Lt. Ray S. Basham, Marietta AFB, Georgia. On his check-out ride in the B-26 he was given a simulated single-engine failure on the right engine while the plane was on the downwind leg. The right engine was not feathered nor rpm reduced, but power was reduced to 13 inches hg. After a normal base leg and approach, he made an excellent touchdown about one thousand feet down a 6,000 foot runway.

When the nosewheel touched down the airplane began to shimmy badly as if the nosewheel damper was inoperative. As the vibrations increased, the plane veered violently to the left. Realizing that either the left tire had blown or the left brake was locked, Lieutenant Basham instantly counteracted the veer of the plane with 40 inches of power on the left engine. He managed to hold the plane on the runway and the instructor pilot was able to ease on the brakes. When the airplane halted, the left wheel was blazing, the result of extreme heat generated by the blown tire. Cutting the switches and abandoning the plane, the pilots stood by while the crash crew extinguished the blaze. Quick thinking and split-second corrective action on the part of this pilot prevented the plane from leaving the runway and averted a major accident.

In situations similar to these, would you do as well?

Aviation Cadet Wallace F. Simpson

1st Lt. Sterling P. Gaffield

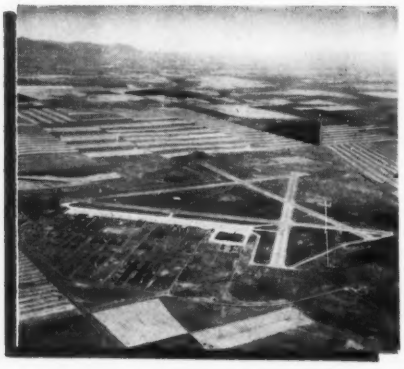
2nd Lt. Clement L. Bittner

LADD, AFB, FAIRBANKS

WHITEHORSE

FORT NELSON

EDMONTON



GREAT FALLS

FAIRBANKS
BIG DELTA
TANACROSS
NORTHWAY
SNAG
AISHIHICK
WHITEHORSE
WATSON LAKE
SMITH RIVER
FORT NELSON
BEATTON RIVER
FORT ST. JOHN
GRAND PRAIRIE
WHITECOURT
EDMONTON
PENHOLD
CALGARY
LETHBRIDGE
CUT BANK
GREAT FALLS

TRIP TIPS GREAT FALLS to ALASKA

SOMEDAY UNCLE SAM might put his famous finger on you and say, "My Boy, I want this airplane in Alaska and you're going to ferry it there."

If you can't find Great Falls, Montana, then there's no use going for you couldn't find Alaska. But when you do find Great Falls, the people there do everything but lead you by the hand to Alaska.

So here you are in Great Falls ready to take off for Alaska. That's what you think! First, operations will send you down to the Port of Aerial Embarkation. There you and your crew will have your orders checked, leaving a copy. You will be given a physical checkup and your immunization records will be checked. The PAE will give you a customs clearance, and for any stop in Canada (whether planned or emergency) you will need a port clearance and a medical clearance. Next, personal equipment men will take you in charge. They will give you winter clothing if you don't already have it, although they much prefer that you bring your own.

The equipment men will also give you winter survival kits. If you're in a fighter, you'll probably be carrying a lot of things in your lap, for these men try to cram as much survival equipment in as they can—they're interested in *you* and your safety. Bomber crews get more survival equipment than do the fighter pilots because they can carry more. Regardless of the type of plane you are flying, you'll receive a type E-18 emergency sustenance kit (one per three men or less, but not over four per aircraft). If you are flying a plane that can carry it, you'll be issued a Red Sled kit.

The personal equipment people weren't completely satisfied with the E-18 survival kit. Though the kit was adequate for certain purposes, they felt that for survival in the sub-arctic regions airmen needed even more things than were supplied in the E-18, such as an ax, signal panels, warm gloves, hunting knives, more rations, etc. There is a carbine supplied in the E-18, but the survival experts think that a combination .410 and .22 over-and-under gun would be of more value in that a carbine is too destructive of meat when used against small game and birds, whereas a shot gun or .22 would not only bring down small game but would also dispell any thought of having bear steaks (a carbine would only make a bear mad with the usual unhappy consequences).

The Great Falls personal equipment people felt that they could do a lot more to advance the cause of survival in the Arctic so Lt. Fredrick Boyd devised the RED SLED—a bright red box about 4 ft. by 2 ft. by 1½ ft. weighing 115 pounds fully packed, with a curved sled-like bottom and a rope to pull it. In it they have put everything that is missing in the E-18. The emphasis is on food. There is enough variety to please even the most finicky feeder and there is quantity enough to keep 43 men going for 10 days when properly rationed. These kits are put aboard your plane for you after a lecture and demonstration of their component parts.

While all this is going on, your plane, too, is being made ready. During the period from 1 October to 1 April which is considered winter, your plane should be completely winterized—de-icing equipment, etc. Preferably this should be done prior to your arrival in Great Falls.

You are now done with PAE and return to operations where the route briefing officer takes over. You are given a crew briefing at which time you are issued a complete route kit which includes:

(1) Pilot's handbook, U.S. to Alaska. This is a fine fat book giving all instrument letdown procedures from A-Abbotsford, B.C. Canada, to Y-Yorkton, Sookatchensan, Canada. It also contains a supplement on survival.

(2) A photo supplement, U.S. to Alaska—a book containing summer and winter aerial photographs of all landing fields along your route and some that aren't.

(3) Radio Facility Charts—West Canada and Alaska, a red-covered book of radio facility charts.

(4) Route Radio Guide—listing all radio aids, to whom to report, and SOP for radio.

(5) Route mileage sheet—a mileage index between each check point, compass variation, and headings.

(6) An airways minimum altitude chart—a diagram showing minimum altitudes between all stations along the airways and their weather minimums.

(7) Notam Summary—a one-page Airmen's Guide kept as current as tomorrow's news.

(8) Flight charts and D/F charts.

The route briefing officer goes over all this material with you, explaining it and answering any questions you might have. If you have a radio operator his briefing runs concurrently with yours.

Next, you are shown a movie of about 30 to 40 minutes duration showing a flight from Great Falls to Alaska along the airways; it covers the key points, landing strips and good check points. It is in sound and a running commentary tells you what things to look for. During winter months you are shown another movie called "Land and Live in the Arctic," a survival film showing how to build a snow house, set traps, and keep warm. An hour before takeoff you will be given your weather briefing—weather en route, forecasts, winds aloft, icing data, plus a weather cross section which is drawn up for you. Your Form 23 is filled out along with your briefing form and then it's up to you.

The route north for fighters (which are cleared only under practically CAVU weather conditions and preferably in flights of two or more) is the same for all other planes—airways. The fighter and light plane gas stops are Edmonton, Alberta; Fort Nelson, British Columbia; Whitehorse, Yukon Territory; and Big Delta and Ladd AFB, Alaska. There is only limited maintenance at all but Ladd.

For longer range aircraft, B-25's C-82's, etc., the first stop would be at Fort Nelson, British Columbia. Fort Nelson and Ladd AFB are GCA equipped. There are numerous landing strips along the route and at no time are you more than 60 miles away from one of them.

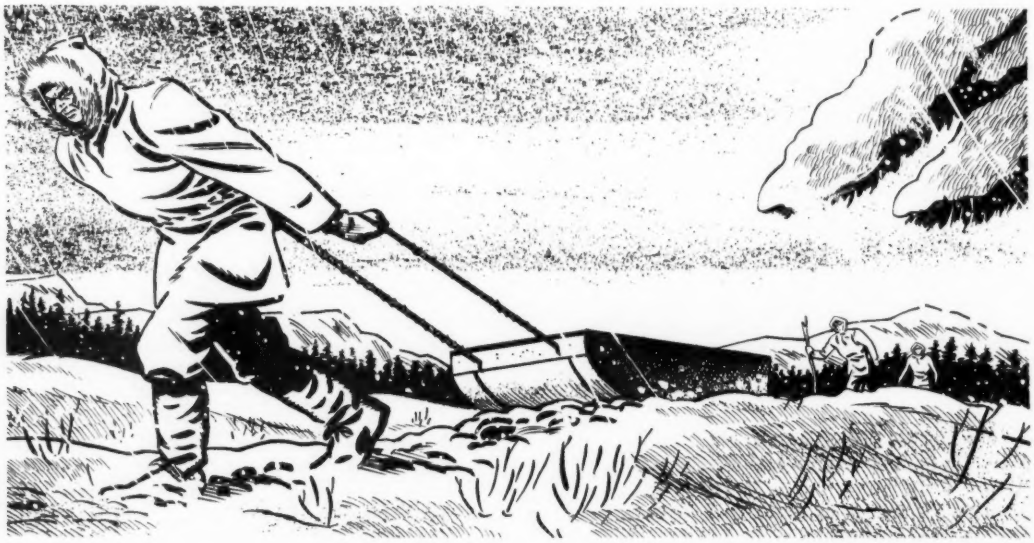
Besides the fields mentioned above, there are three stand-by strips at Smith River, Watson Lake and Snag. C-54's, B-29's and their ilk go non-stop Great Falls to Ladd.

The weather on this route is generally good. Summer weather is very good. The worst times of year according to the Great Falls weather people and MATS scheduled pilots are during spring and fall, for during these periods icing conditions become nasty. Winter flying weather as far as icing goes is not bad for the temperatures drop too low—40° to 50° below freezing. The worst icing occurs over the Wolf Mountain Range from Fort Nelson to Fairbanks.

There is also another route to Alaska. This is from McChord to Anchorage along the sea coast. However, the only planes flying this route other than very long range bombers are the bi-weekly MATS scheduled round trips in C-54's and MATS flights to Alaska carrying fresh vegetables and 1-B priority passengers from McChord. No ferry trips clear this way for most of it is over open water, the weather is bad and extremely few landing fields are available—which explains why 90% of all Alaska-bound planes fly the Alcan (or inland) route.

All fields in Canada are good; instrument letdown procedures are published and there is no difference in flying this route than there is in flying Green 3 or Amber 7 or any other airway in the U.S.

The people at Great Falls give you the briefing on route, weather and survival conditions and expect that in addition, you as a pilot should do for yourself the same planning as when flying in the Z.I.



MEDICAL SAFETY

SLEEPING IN THE SUN

WE COULD all take a lesson from Lazybones—his relaxation is natural and easy.

Relaxation has been defined by some as the "Art of Living." Indeed, a stroll through any city during any noon hour would cause most people to be convinced that we have lost entirely this art if we ever had it. We stand at quick-lunch counters, stuff cold, poorly prepared sandwiches down and hurry back to the noisy "too many desked" offices for another meeting, conference or just to wait.

The cities are not the only spots where business is conducted without regard for the human engine—Some personnel in almost all Air Force headquarters, large and small, are guilty. What Air Force instructor pilot would allow his student to maltreat the airplane engine in such a manner? No, the airplane costs money—that is tangible. There are all sorts of regulations covering every step that a pilot must take from the starting to the stopping of the airplane engine.

The human engine can not be measured in dollars and cents. Unfortunately it is not stopped at the end of each day for complete rest or simple replacement of worn out parts.

It is true that we have hours in which to work, but who can honestly say that he goes home and completely relaxes? People differ widely in their temperaments so one man's relaxation may be another's tension. A great deal may depend upon the type of work one does, the amount of energy and the concentration expended while working combined with the mental anxiety associated with the execution of his duties.

Some people can go to sleep while rocking in a chair—Step-'N'-Fetchit has characterized those who can sleep standing up. Winston Churchill relates that he gains the greatest amount of new energy from little "cat naps" snatched in the hours of his most trying tension.

For most of us the trick is to retire early and get the benefit of a prolonged rest in bed. But some of us take our troubles to bed and attempt to solve them there and the next morning we are worse off.

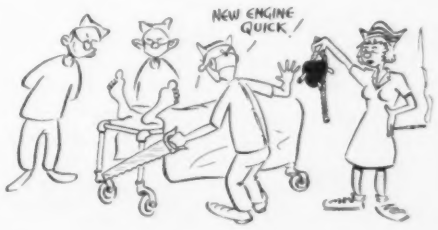
The pilot's profession subjects him constantly to all sorts of mental strain. Anxiety as to whether his plane will perform with full efficiency, or whether the judgment of the operator will be normal under stress, may create fatigue following flight.

The human body is wired with nerves much more delicate than the electronic systems of airplanes. The constant pressure of daily activities, long-continued physical and mental tension overloads this infinitely fine mechanism and results in fatigue—fatigue that accumulates insidiously until exhaustion superimposes itself with serious detriment to the general health. Fatigue may be the result of a tiring routine, not the result of overwork but monotony—sleep will not cure this fatigue, but change will.

An assignment to an undesirable job or an undesirable outpost (even though the work may be extremely easy) is an example of this type of monotony. The man with a hobby learns to relax through mental change, whereas, the other less fortunate individual interests himself in nothing and constantly nags himself mentally with, "When will this come to an end?"

Learning to relax is an art that can be developed according to the particular needs of the individual concerned. Useful hobbies will release pent up emotions and permit relaxation.

Physical exercise in its many forms presents relaxation for a great many and is recommended. However, drugs to induce sleep are not recommended except under the doctor's supervision since they are extremely dangerous. Their habitual use may permanently damage the central nervous system, which, when damaged is never repaired. No engine change is possible here.



ACHTUNG

AT THE BEGINNING of World War II, Reich Marshal Herman Goering gave each Flieger the one-time word on the subject of violating flying regulations while in the employ of the Luftwaffe. The German Air Force accident or violation report was known officially as a "Disturbance Report." When a pilot got his name on a Disturbance Report it was usually SOP to give him a large boulder, a tack hammer, and a five year plan during which he was to convert the boulder to sand.

The Reich marshal really took a dim view of anybody in his air force who violated regulations and in a letter to his commanders in the field, Goering said, "I order that in cases against flying order and discipline the disciplinary superiors will take merciless action with the utmost strictness against the guilty ones and advance their education as flyers with all means at their disposal. They will be directly responsible to me to see to it that the efficiency of the troops will not be weakened due to careless accidents."

His order of "merciless action" worked two ways. If a superior failed to take action in cases of infractions or if he did and the action was not severe enough, then Herman had two candidates for the rock farm.

To cite examples of how flying safety was promoted in the Third Reich, the following should suffice:

Lieutenant Engler, Pilots' School C. Wiener-Neustadt, received five years in prison and reduction. On a navigational flight he temporarily permitted the flight engineer to take over the controls and then made turns below the prescribed safe altitude over a town. Following this Engler flew up a valley where due to downdrafts the airplane could not be climbed over a ridge; the aircraft crashed due to contact with a tree and was destroyed. Four occupants were killed and two seriously injured.

And then there was the case of Lieutenant Schmidt of the Blind Flying School. He got one year in prison and was reduced. He had been ordered to fly a JU 52 on the 12th of June 1941 from Gardemoen to Neuruppin. After the first intermediate landing in Kopenhagen he did not gas up. He pulled the same trick after landing at Prenzlau. Following the takeoff from Prenzlau, the engines failed after 15 minutes due to lack of fuel. An attempt to reach a meadow failed and the airplane crashed in a forest, causing three members of the crew to suffer injuries.

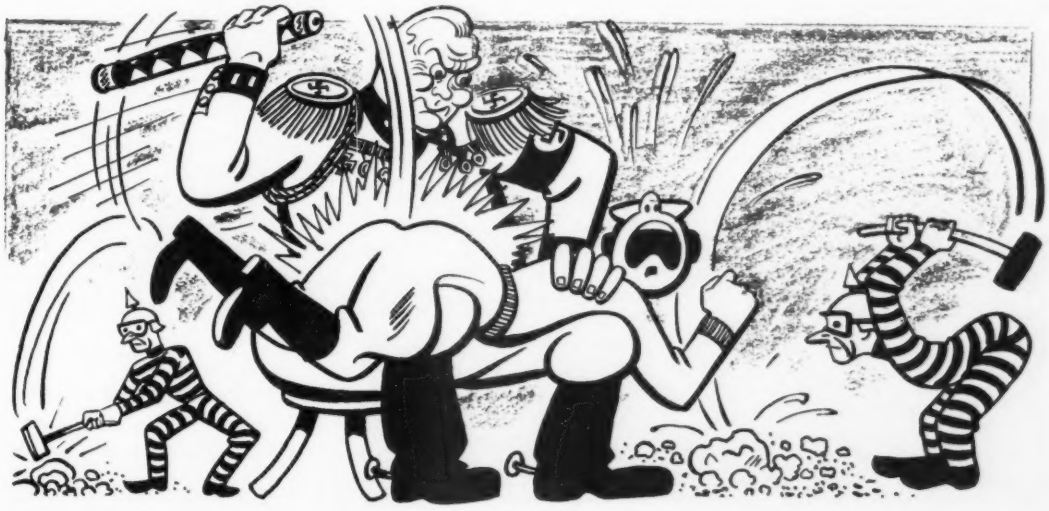
Student officers have had their day in the GAF too. Lieutenant Schaefer, Student Pilots' Training Regiment, Pardubitz, was sentenced to eight months in prison and was also reduced in rank. On a cross-country flight Lieutenant Schaefer did not gas up at his home airbase and promptly deviated from his flight assignment without authority to land on another base for refueling purposes. Coincidentally, his relatives were residing in the vicinity and he also had been living there for 10 years. After practicing a good number of steep turns at a very low altitude over the domocile of his relatives, he left the base after landing to visit his relatives and talk flying.

Not to be outdone by his cronies, Lieutenant Kornblum of the 10th Squadron Bomb Wing, during a cross-country flight from Lille to Bruxelles, executed low-level flights without authority. When flying over a bridge at an extremely low altitude the aircraft contacted an obstacle (telegraph line) and an emergency landing had to be made due to damage of aircraft. Not to be outdone, his superiors gave him six months at a lower altitude yet.

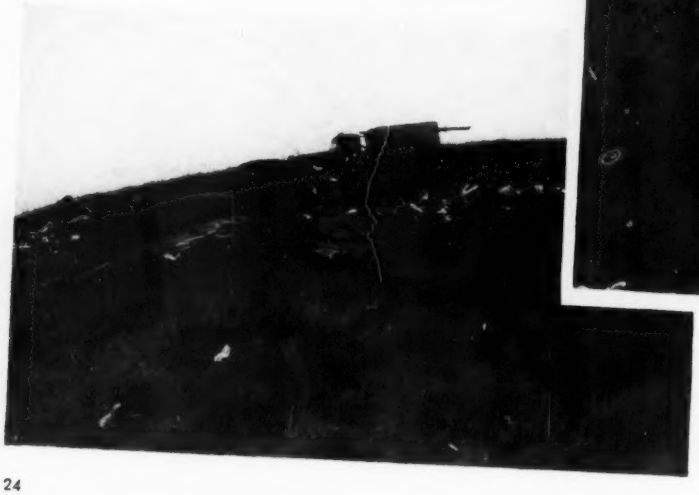
YOU NEVER HAD IT SO GOOD

Lieutenant Klein and S/Sgt Satow, Special Purpose Bomb Wing 1, got four months and two months in the pokey, respectively. Lieutenant Klein as commander and S/Sgt Satow as pilot were on a delivery flight and made an intermediate landing in Prague-Rusin. In Prague-Rusin Lieutenant Klein had the opportunity to visit a relative who expressed a burning desire to go along on a flight. Following an initial refusal, a flight was undertaken under the pretext of a communications or a local weather flight, and three buzzin' cousins were taken along who were not members of the Wehrmacht. During this, low level flight was practiced without authority.

The fact that even threats of jail failed to impress irresponsible GAF pilots suggests that there are many ways of moving men, but only one way that may be depended upon to bring about the use of sound judgement and dependability. You can push people around with a strong arm. You can overwhelm them with authority. You can stampede them with fear. You can confuse them with falsehood. You can wear them down with endless argument. But the only way of making men obey regulations willingly and effectively and of keeping them moving in the right direction, is to impress them with the responsibilities and liability entrusted to them so that they will stay on the straight and narrow of their own free will. (The incidents cited in this article were extracted from captured German Air Force flying safety records.)



YOU DON'T NEED



PROPHET

The C-47 had been drumming along under clear skies for 300 miles. The pilot was nodding in his seat as "George" kept the plane boring ahead and the co-pilot occasionally stirred himself to make a position report. After a time the co-pilot shook the pilot's arm.

"Hey, Red, we're moving in over a cloud deck. Looks pretty solid up ahead. Memphis is reporting 1200 overcast. Want to file IFR or go under it?"

Red sat up and looked ahead. "Aw, let her ride a while. It'll probably be broken up before we hit Memphis."

"It's a violation, Red. I think we oughta file IFR or else get down under it. Looks pretty low. I'll call Nashville Radio for a clearance." The co-pilot reached for his microphone.

"All right, Granmaw, I'll take her down." Red reached down and turned off the auto-pilot. "You're sure gettin' to be an old woman."

Red slipped under the overcast just below the base of the clouds and continued on course. At times he had to drop down to 800 feet to maintain contact with the ground. Each time he started down the co-pilot would squirm a little, but he said nothing. About 60 miles east of Memphis, his destination, Red was forced to detour around a rain shower. He was seldom more than 800 feet above the ground while flying below the overcast.

Gradually the ceiling dropped and the C-47 was flying through intermittent rain. Finally the co-pilot could stand it no longer. When Red dropped down to within 500 feet of the ground to get under some scud, he leaned over and shouted.

"This is bad business, Red, and you know it is. You're on instruments right now on a VFR clearance. If somebody reports us our names will be mud. Let's climb up and get an IFR clearance."

"Settle down, Granmaw, I'll get us in," Red said as he wracked into a steep turn to head for a light spot in the rain shower.

The co-pilot had sense enough to be scared. He argued, "This is dangerous. Come on, let's climb out on top."

The radio compass needle which had been pointing to Memphis Radio began to oscillate.

"We're on the station," Red shouted. "Call the tower and tell 'em we're two miles south for landing instructions." Red rolled into a steep right turn and eased up just under the overcast at 700 feet indicated (431 feet above the ground) as the co-pilot with a sigh of relief reached for the microphone.

As he filled out the Form 1 on the ground, Red boasted, "I've done that a hundred times. Saves all the bother of holdin' and makin' a let down. Brother, I like to see where I'm goin'.

The co-pilot regarded him searchingly for a moment. "You'll pull that one once too often someday and you don't need a prophet to tell you where you're going."

The two pilots switched seats for the last leg of the flight and conducted a normal IFR flight back to their home base. Three weeks later Red cleared on another cross-country, this time in a B-26. He didn't have a co-pilot.

The first leg of the flight was uneventful. But as he neared his destination on the last leg of the flight he encountered low ceilings and poor visibility in light rain showers. The closer he got to his destination the worse the weather became. He let down through a hole to 600 feet and apparently spent the last minutes of his life trying to save himself the trouble of holding and making a let-down. Three people later reported seeing a B-26 flying at altitudes varying from 150 to 400 feet above the terrain in intermittent rain and fog. The wreckage was found scattered across a hillside amid a shroud of high tension lines Red had flown through just before the crash. The five people aboard were killed.

This pilot killed himself and four innocent passengers in the type of accident that results in more fatalities than any other form of violation—contact flight in instrument weather.

Weather minimums for VFR flight were established to prevent just such accidents. Time and again FLYING SAFETY and other educational publications have emphasized the folly of attempting to penetrate instrument weather by flying contact. Flying Safety meetings in units all over the world have dealt with the subject over and over again. This pilot paid his life and the lives of four other people for his refusal to comply with regulations and sound safety principles.

Perhaps his example will be of value to the vanishing breed of pilots who still practice such folly. If you are one of that unfortunate group you don't need a prophet to tell you your future. Your future is an oily smear across the face of a low hill somewhere near the destination of your last flight.

Ward's Folly

OR A Few Precepts of the Gump Check

By A/C John D. Ward, Class 50-F

Dedicated: To my instructor, who very quietly, and I imagine with a very amused or amazed attitude concerning my intelligence, sat peaceably in the rear cockpit and watched me make an ass of myself, twice!*

Foreword: Confucius once said "Learning without thought is labor lost." Put into more emphatic phraseology it might be said that "Having one's head up and locked isn't conducive to proper aviating." In fact, people get killed that way.

Introduction: This little essay concerns a very short, extremely necessary, and it seems for me an extremely easy to forget, procedure. The GUMP check is the procedure which my instructor asked me to discuss to the extent of some 1500 words. Gump is very easy to do, and requires but a short period of time to accomplish. I will endeavor to instil in myself the knowledge of its extreme importance.

"Experience," as the old axiom will tell us, "is the best teacher." It might be added to this, however, that it is also the most expensive teacher. We learn through our own mistakes, but if each student pilot in the cadet program were to land a T-6 with its gear up just to sharpen his memory, the cost of our training here at Randolph would be running neck and neck with our national debt. To defray and reduce this unnecessary expense, each student is given a list of procedures to follow. This list contains some very good ideas. I believe all instructors personally recommend they be followed. Or else!

One small but important bit of information contained in the aforementioned list of procedures is the GUMP check. Brought down into its component parts it can be better explained:

G—Gas on fullest tank
U—Undercarriage, down locked and checked
M—Mixture full rich
P—Propeller 2000 rpm

As small as it is, many dangers and hazards will arise if it be forgotten. If remembered, it will definitely save wear and tear on an aircraft. Remembering it will prevent an overcrowded condition in the maintenance hangars, thus better utilizing manpower for the job on the upkeep of the flyable aircraft at hand. It will keep soldiers from the rank of major on up happy (thus keeping everyone else happy) when they don't have to read accident reports. Last but not least, it will keep an instructor from growing bald. (I hear they tear their hair out when a student of theirs belly-lands an airplane for no particular reason.)

Common sense should tell a pilot to go through the GUMP check just to get his gear down so he will be able to make a more perfect landing. If his common sense doesn't tell him anything, he should do it anyway. I suppose it is a recognized fact that a new student pilot has a negligible amount of common sense concerning aircraft and the piloting of same. He must, therefore, obey blindly any and all procedures given or even mentioned to him. Common flying sense is a thing to develop. It can be developed only through experience. Through experience, one can develop a method. Thus an expert is born. An expert is a person who knows more and more about less and less.

The old postulate of "Safety First" should be a beacon in the guiding light of good piloting. If a person shrugs off or has no fear whatsoever of the dangers he may cause to himself through poor judgment or bad memory, he should at least have a little consideration for the poor fellow that may have to dodge carefully or land on top of his damaged aircraft. I shudder to think of all the things that might happen because of laxness in the following of our little GUMP check. Take for example John D. Smoe who has come in for a landing without even remembering what a GUMP looks like. (Who could be so dumb?) La-de-da, he comes in for a beautiful roundout for a perfect landing. He can't hear what is being shouted over the radio

*Cadet Ward, after failing to go through his *Gump* procedure on landing, was requested by his Instructor, 1st Lt. John W. Planimac, to write on this theme. The writing of such "essays" is occasionally used by instructors at Randolph as a training aid for students who seem to require it.)

because some blasted horn is screaming somewhere. "Hold it off, hold it off," he is whispering to himself. Suddenly a whoosh of a flare passes by, and while in the process of wondering just what is going on, CRUNCH! "Wot hoppen," he shouts aloud.

We all know what happened, and little John D. will soon find out from many belligerent people exactly what happened. Meanwhile, the field is closed for repairs, an airplane is *picked* up for repairs, and a lot of fellows are up in the blue with no home field to return to for a while. Joe Doakes up on his first solo in the second period is running low on gas, and doesn't know it. Happy Hot Rock with his eyes gleefully glued on the gruesome spectacle below is flying at about 75 mph in the pattern. Yes, many things could happen because of that little GUMP check. Misfortune, we all know, always comes in by the door that has been left open for it. Since we can bear up better under the misfortunes of others then we can our own, we should try to be wise and learn from them what to avoid.

If a person is lucky enough to be given a second chance to rectify a mistake, it is a pretty good idea to remember what the first one was. I think it was Cicero who said, "To stumble twice over the same stone is a proverbial disgrace." Chances are, a fellow not only could be disgraced on the second chance, he might accidentally get clobbered. This is very unnecessary and expensive to the government.

Insurance	$10,000
Education	$35,000
Aircraft	$? ? ?
Total	A lot of money

Therefore, if only in consideration for the taxpayer, use each and every procedure and correct each mistake immediately.

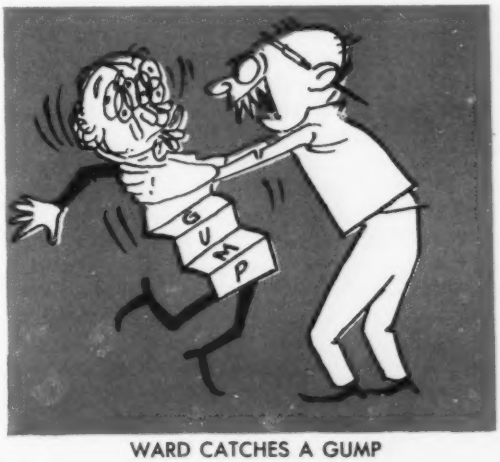
Each little letter in our GUMP check has its meaning, as I have already shown. The UMP, check, I hear, has been substituted for the GUMP check with very little success, and might cause considerable damage to prop and flaps. There is a story floating around about the fellow that landed wheels up in a weed patch with one tank dry and one tank full. I imagine he was deeply embarrassed and greatly humiliated.

The Warning Horn is a very handy device. A poor place for it to be sounding off is at the key point on the base leg. The proper place is when checking its operation on the entry leg of the traffic pattern. If any one is unfortunate enough to be flying a plane which has a malfunctioning horn, it is a good idea to keep listening to the runway control on the approach. They will very readily inform the forgetful if perchance he has forgotten anything like the landing gear while attempting to land. Of course, forgetting the gear makes for a very handy go-around procedure, for it can promptly be forgotten again since it is already up. A person is, however, apt to get tired of hearing the control truck say, "Plane on final, go-around, your gear is up," as the man on the control truck is of saying it. To alleviate boredom to both parties concerned, the pilot should do—you know what.

I want to say that the thing to keep in mind is the GUMP, GUMP, GUMP—remember the GUMP. I am sure all good pilots do. Since the main purpose of this program is to produce good pilots, all procedures here must be performed accurately and promptly in their *proper time and place.*

It is a cinch that heaven won't help those who don't help themselves. One might, however, help himself *into* heaven, but nothing more. It sure is the little things that count . . .

INSTRUCTOR CATCHES WARD



WARD CATCHES A GUMP

Automatic Approach and Landing for High Speed Aircraft—AMC, in conjunction with Lear, Inc., and the All Weather Flying Division, is working on an automatic pilot and associated approach instruments necessary to permit automatic approaches and landings in high speed fighters.

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Air/Ground Radio Discipline—All pilots should make certain they are familiar with AF Letter 60-14 dated 16 August 1949 on this subject.

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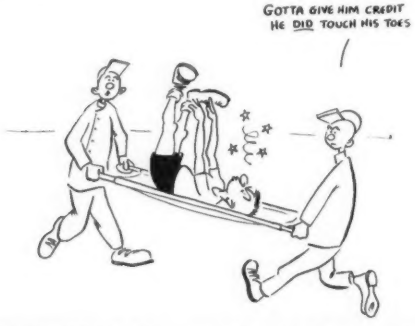
New In-Flight Refueling System—An in-flight refueling system whereby a B-29 tanker refuels a B-50 by means of a telescoping pipe has been developed.

In using the new technique, two planes fly in formation and the controlled, telescoping refueling boom carried beneath the tanker plane is inserted into a socket in the nose of the receiver plane and fuel is transferred under pressure.

It is expected that this new method will alleviate some of the difficulties encountered in gravity feed refueling, and will require less time for a complete refueling.



Physical Training—The School of Aviation Medicine has been working on a project to determine if there is any relationship between the physical condition of the individual for strenuous physical work and his ability to maintain efficiency for a long period of comparative inactivity, such as flying an aircraft for 15 to 20 hours. Results of this study have been such that all aircrew members may soon be making with the muscles like the strong "PT" men of yesteryear. One question that may be asked by a lot of pilots is this, "How did the medics arrive at the conclusion that flying a B-29, B-50, or any other airplane for a period of 15 to 20 hours is a period of comparative inactivity?"

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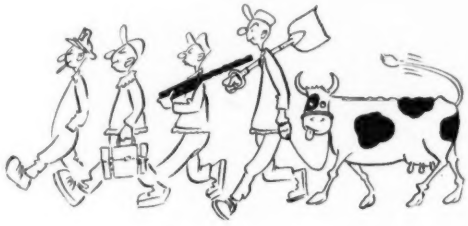
The Perfect Food — According to the School of Aviation Medicine, one of the main items of diet which is universally liked and missed when not provided is whole fresh milk. Substitutes have been tried on bomber, transport, and air evacuation crews, but have not been acceptable to air personnel. Doctors believe that if it were possible to provide wholesome whole fresh milk to bomber and other crews on long missions, the problem of in-flight feeding would be materially reduced.

The medics at the School of Aviation Medicine are trying to find a method of keeping milk fresh and wholesome for a week without refrigeration. Success in this project is expected.



Upper Winds—Study of very strong upper winds, of over 150 mph, which constitute hazards to aviation has recently received attention in Australia. Dr. H. M. Treloar of the Central Meteorological Bureau, Melbourne has pointed out the value of this information to aviation and defense planning.

When plotted against latitude, Dr. Treloar said that the strongest winds suggest a curve in which the extreme winds are about 170 mph at 60 degrees, rising to 270 mph at 35 degrees, and falling gradually to 150 mph at 15 degrees. Some regions apparently have stronger upper winds more frequently than others. The eastern parts of the Asian and American continents are two such areas, according to Dr. Treloar, possibly because of the great temperature contrasts which occur when the cold winter air of these vast land masses is brought into juxtoposition with the warm air of lower latitudes. It was suggested that the strongest wind likely to be experienced at high levels (30,000) would be 300 mph. Further study of the upper air is being conducted by Dr. Treloar.

Unsatisfactory Condition—A U.R. was recently received from Wright-Patterson AFB describing the difficulties encountered with H-5 rotor blades collecting water due to rainfall entering blades at an unknown point and collecting in the rotor blade tips. The accumulation of water was different in each blade, causing an unbalanced condition. H-5 pilots who encounter excessive vibration when starting helicopters for the first time following a rain should immediately stop the rotor and investigate.

✦ ✦ ✦

Landing Gear Warning Signal—Because 11 per cent of Air Force accidents for the 12 month period ending 1 July 1949 were caused by pilots landing wheels up, it is believed that some additional warning device is necessary. A new device for incorporating an audio signal into the headset to give pilots an additional warning when a plane's landing gears are not down and locked is being tested and evaluated. With the new interrupter installed, pilots would hear a dash for one twenty-fourth of a second followed by silence for the balance of the second when the gears are unlocked and throttles retarded. If approved, the audio interrupter is to be tried as an interim measure until something better can be devised.

✦ ✦ ✦

Air Rescue Service—The world-wide activities of the Air Rescue Service have been reorganized to effect greater economy and improve operational effectiveness.

The 1st Rescue Squadron will have headquarters and Flight A at MacDill Air Force Base, Tampa, Florida; Flight B will be at Albrook AFB, Canal Zone, Flight C at Ramey AFB, Puerto Rico, and Flight D will be at Kindley AFB, Bermuda.

Headquarters and Flight A, 4th Rescue Squadron will be at Hamilton AFB, California with Flight B located at March AFB, Flight C at McChord AFB, Washington, and Flight D at Hickam AFB, Hawaii.

The Fifth Rescue Squadron and Flight A will be located at Lowry AFB, Flight B will be at Biggs, Flight C at Maxwell and Flight D at Selfridge.

The headquarters and Flight A of the Sixth Rescue Squadron will move to Westover, with Flight B located at Ernest Harmon AFB, Newfoundland, Flight C at Goose Bay Airport, Labrador and Flight D at Bluie West One, Greenland.

Headquarters and Flight A of the 7th Rescue Squadron will be located at Wiesbaden AFB, Frankfurt, Germany, with Flight B at Lagens Transport Station, Azores, Flight C at Wheelus AFB, Libya, and Flight D at Dhahran AFB, Saudi, Arabia.

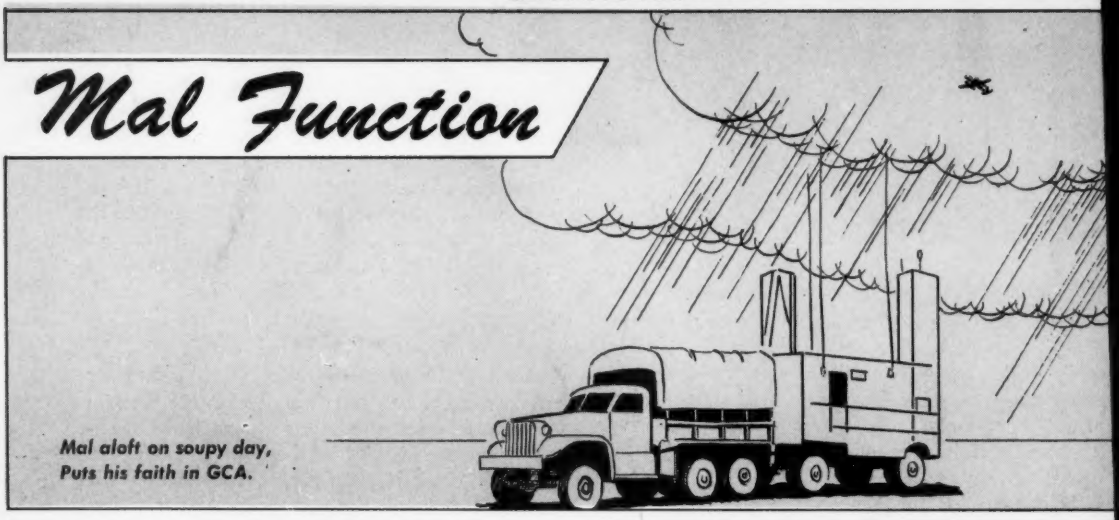
✦ ✦ ✦

Restful Recuperation — Undue physiologic or psychologic wear and tear because of nervous strain and frequent exposure of air crews to harmful environmental conditions have been suggested as being linked to vital statistics which show that Air Force pilots have on the average an earlier retirement for disability and a shorter life expectancy than comparable non-flying officers. The School of Aviation Medicine believes it is possible that a reduction in the cumulative fatigue which leads to early terminaton of flying careers may be achieved by a reduction in the time it takes a pilot to become completely rested following each flight. Earlier and

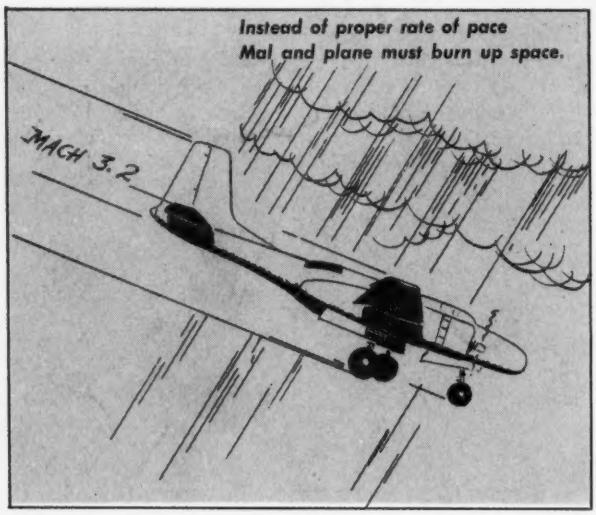
more complete restoration to full fitness for flying after brief or extended fatiguing tasks may increase the effectiveness of flying personnel.

An increased tolerance to frequent strenuous missions in high performance aircraft and also a diminished flying accident rate may be the direct result of properly administered and selected recuperative procedures. Care of the flier between flights and following strenuous tours of duty perhaps should include special recuperative programs varying from a message to a planned vacation. A project to find the best methods of recuperation from impairment of performance as a result of previous activity is now under way at the School of Aviation Medicine.

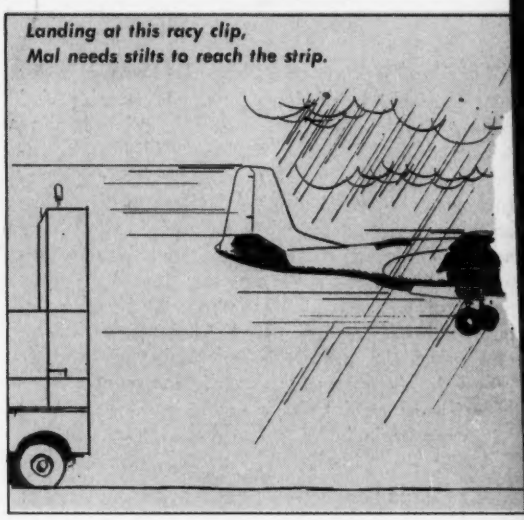
Mal Function



Mal aloft on soupy day,
Puts his faith in GCA.



Instead of proper rate of pace
Mal and plane must burn up space.



Landing at this racy clip,
Mal needs stilts to reach the strip.

Wheels touch down at last. Alas!
Runway has just turned to grass.

If you think Mal got bum steer
Like Mal, you're wet behind the ear.

☆U. S. GOVERNMENT PRINTING OFFICE: 1950—